Gleaner

MAY 27, 1964

The microscope and the student . . .
always a symbol of scientific searching
for the unseen and unknown.

Digitized by the Internet Archive
in 2010 with funding from
Lyrasis Members and Sloan Foundation

http://www.archive.org/details/gleaner63364stud

The Gleaner

Delaware Valley College of Science and Agriculture

Vol. LXIII, No. 3 May 27, 1964

IN THIS ISSUE . . .

Editorial 4
Letter from the President 4
Joseph Krauskopf Memorial Library 5
William F. Stock '65
Love Always Elaine 6
William M. Jones '66
Someday 6
Michael R. Rigolizzo '64
The Owed to a Herse 6
Michael R. Rigolizzo '64
Applied Ecology—On Earth, In Space 7
Gabriel Bruck '64
Medicine and the Law 10
Anthony Schiro '65
A Pilot is Born 12
Michael R. Rigolizzo '64
Kenya 14
Mwangi Maganjo '67
Crossword Puzzle 15
Michael G. Price '64
Old Men 16
J. V. Brown '64
Phoenix 16
William M. Jones '66
Notes on Color 17
Anthony Mulle '66
The Careers of the Graduates of D.V.C. 18
Dr. Peter Glick, Jr.—*Director of Graduate Placement*
Student Literary Contest 24

The Gleaner *established 1901*

Publisher
William M. Jones '66, *Editor*

Associate Editors
Marvin Olinsky '65
Henry McCarter '66

Assistant Editors
Albert J. Muscle '66
William M. Jones '66

STAFF

Editorial
Marvin Olinsky '65, *Special Editor*
Michael Rigolizzo '64
Louis F. Coppens '65
Thomas J. Slimocosky '64
Michael G. Price '65
Anthony Mulle '66
Philip Jurchak '66

Business
Richard Snyder '65, *Manager*
Anthony Spinelli '65

Typing
Arthur L. Tucke '66, *Manager*
Robert Pras '64
Baron C. Feldmar '64
Edward L. Lindemann '65
Donald Goss '64
James C. Hower '64
Gary F. Barrick '64
David Heebner '64
Richard Glaser '65

Circulation
Albert J. Muscle '66, *Manager*
Thomas Merker '64
James Morley '67
Edward B. Dry '64

Photography
Ronald H. Smith '65, *Manager*
John R. Bayliss '64

Art
Gary Brubaker '67, *Editor*
Vernon Brown '64
Lane Davis '67
Dennis Dolinsky '65

Make-up
Jonathan Greene '67
Richard Wanderman '64

Faculty Advisers
Mr. Reginald D. Forbes
Mr. Harold E. Snyder

Student Advisor
Robert M. Hilsen '64

Editorial....

Recently we have seen the passing of a great man — Douglas MacArthur. His achievements, his ideals, and the words he has left behind all lead me to regard him as the greatest man of our time. He not only made history but has left to us principles to live by. His own words "Duty, Honor and Country" were the credo by which he lived.

I am sure most of you have read his address to the cadets of the Military Academy when he received the Thayer Award some eighteen months ago. You should all read it, and re-read it. I dream of the day when we all have the love in our hearts for our Alma Mater which Douglas MacArthur had for the corps at West Point, the love he lived with and died with.

James Work
April 10, 1964

HELP WANTED #2

In an editorial of the March 1964 GLEANER we asked the student body and the faculty to aid us in our attempts to improve the quality of the Gleaner. We stressed the fact that only with the support of the student body and faculty, could we attain our goal of a top quality GLEANER. We have received faculty support and interest. We have received student comments and suggestions on the last GLEANER. We recognize the value of these comments and welcome them as a means of attaining our goal. To the students who are critical simply for the sake of criticism we ask them to be objective and give us their support and contributions. It is one matter to criticize but another matter to offer a solution to the matter being criticized.

We placed an added incentive on student support by running a student photo contest and offered thirty dollars in cash prizes. We received a total of twelve pictures. Does this show student interest?

One of the main factors which led to the type of GLEANER published in some past years was the fact that the publication was written and run entirely by the staff. We have tried to attain a balance between staff articles and articles by those not on the staff.

It also appears from the showing of student interest that many of the students are not concerned with the type of publication that we send to those outside of the college. The GLEANER we publish bears the name Delaware Valley College. The pride in our college alone should motivate the students to be interested in the quality of the publication.

We are again seeking student contributions for the GLEANER. Again we are offering cash incentives for student interest. Perhaps this time we will receive proper student interest and support and will be able to publish a GLEANER of which everyone can be proud.

It is the policy of the GLEANER to seek contributions from the entire student body. To add interest to this program, the GLEANER announces a series of cash awards for literary contributions. The general nature of the awards is stated on the outside back cover. It is hoped that these awards will stimulate student interest.

THOUGHTS OF ONE WHO CAME TO HONOR CAESAR— NOT TO BURY HIM.

Once I was Caesar, mascot of D. V. C., proud of the status I commanded among the students of my domain. I gave great love and affection to all of them; during those years in which I represented a degree of perfection, they too were proud of me and loved to exhibit my person and my various antics for all who might be interested in observing my fine masculinity and intelligence. Unfortunately life has a span. Starting as a brilliant youth I first blossomed into gorgeous manhood (which all admired) and then became a semi-decrepit old man which few admire and most despise. However, since I had given my best years of my life to D. V. C. I had naturally expected that there would be some respect for me and my person and that I might be retired to green pastures and a fold in which some bright young ewes might gambol so that I might recall the days of my irresponsible youth. I thought, and I believed with some reason that there might be a little sentimentality connected with my passage from the prime of life to that sad decadence which some people call "the golden years" but it appears that our college is in a land where use must be made of that which would otherwise be useless, and so I do not see bright young ewes jumping over fences or teasing me with their gamboling but instead have been quartered, and my various physiological parts examined. I trust that many persons would choke to hear me say—"You who once admired me, you who once claimed me as your friend, you who have betrayed me, 'et tu, Brute.'"

Joseph Krauskopf Memorial Library

Michael G. Price '64

On June 7, 1925, on the grounds of the National Farm School, Founder's Day was being observed. But something else was occupying the minds of the crowd that had gathered: the new Joseph Krauskopf Memorial Library was to be dedicated. The weather was extremely warm and the crowd sweltered under the afternoon sun. Only a year previous on June 6, 1924, also Founder's Day, the cornerstone had been laid for the Library.

The day, June 7, 1925, two years after his death, was to see the realization of the second of Dr. Krauskopf's goals. Dr. Krauskopf wanted first to start the Farm School and, secondly, to construct a library building at the School in exactly the same manner and architecture as his library in Philadelphia.

The money for the construction of the Library was obtained from friends of the school. Money was also taken from the Jubilee Fund, established on the School's 25th anniversary.

The dedicatory address of the Library was delivered by Dr. William H. Fineshriber of Philadelphia, who described the new building as "a shrine to the Jewish people of all America."

The Library building itself is of Italian design and blended with Lasker and Rosetta M. Ulman dormitories. Two tile mosaics by Dr. Henry C. Mercer, of Doylestown, depicting summer and autumn, were placed in the walls above the front and rear entrances, respectively.

As one entered the Library through the front door, he found himself in the first of two large rooms which composed the Library. Suspended from the high ceiling was an impressive brass chandelier. A gallery surrounded the forum. In this room speakers of prominence would be invited to address the students. It was to serve as the place where commencement exercises would be held for several years. The shelves in this room were used for the Farm School books, which totaled 5,000 volumes and which had outgrown their old quarters in Segal Hall. The Librarian, Miss Rebecca Churchman, who was a matron at the School, did a great deal to arrange, build up, and supervise the Krauskopf Memorial Library.

On the wall between the forum and Memorial Library was a plaque telling of Dr. Krauskopf's desire for a library. It is taken from his last will and testament and reads:

> "It is my hope and fervent prayer that some philanthropists may, in the near future, erect on the grounds of the National Farm School a library building, and so equip it as to meet the School's constantly growing needs. Should, however, my summons come before such a building is erected and equipped, I trust that the Board of Directors of the National Farm School may find the means of reproducing, on the grounds of the School, the architecture of my own library at 4715 Pulaski Avenue, Philadelphia. Into this building, when erected shall be placed my own books, in the same order, shelf by shelf, which they occupy at my home. These books are to be the property of the National Farm School, and are to be used within the building only. They are to serve as reference and study, and not for circulation."

Looking around one can see the 10,000 volumes which Dr. Krauskopf donated and which were placed in the Library on May 12, 1925, after Mrs. Krauskopf recataloged and rebound many of the books and manuscripts in her desire to turn her husband's library over to the School in perfect condition.

Also brought from Dr. Krauskopf's home was his art collection which consisted of fifty-three pieces of art, some of which were: Chinese Buddha; Maccabee, by M. Ezekial; Apollo (bust); Shakespeare (portrait); portrait of Abraham Lincoln; David, by Michelangelo; Cicero (bust); Winged Victory of Samothrace; Lorenzo de Medici; Charles Dickens (bust); Trial of Joan d'Arc; Egyptian Sphinx; Disraeli (bust); Old Hebrew manuscript on parchment found in genizah of an old synagogue in Cairo.

Most of the furniture of Dr. Krauskopf's library was brought up to the Joseph Krauskopf Memorial Library. In the room which is the replica of his library in Philadelphia his books were placed just as they were when he died. The paintings and statuary along the walls were placed in the exact positions which they held in Philadelphia. Off from one end of the Library is a little office—a copy of Dr. Krauskopf's "den" with the desk he used placed in the center of the room.

Love Always, Elaine

William M. Jones '65

"Love always, Elaine." He looked up from the Christmas card in his lap and stared at the lights on the tree. Why the "Love always," he thought; she could have just signed her name. He remembered, now, the night last week when she had come to his place with his sister after school; how closely she had watched him working on his amplifier in the den; how near she had stood to him; how the smell of her had made his pulse rise. It was the first time he had ever really noticed her. Somehow she had always been just his kid sister's friend. But now there was something different. Her movements had become graceful, almost sensual, her voice softer, her body fuller, her laugh quieter and more gentle.

He turned his head and looked out the window, his eyes falling on a huge angel in the park. Spotlights played on the soft wings, the perfect head, the hands obediently folded in prayer. There was a small hole below the hands. Some kid probably threw a rock at it, he thought. The hole seemed to destroy whatever it was the angel was meant to be.

He looked at the card again. Maybe I ought to ask her out, he thought. He got up from the chair and walked quickly into the hall. He sat down at the desk, opened the drawer and took out the telephone book. He found the number; picked up the receiver, and dialed. He was surprised to find himself feeling a little nervous. It was the first time he had ever felt that way about asking a girl for a date.

"Hello?" The voice startled him.

"Elaine?"

"Yeah?"

"Hi, Ray Degering"

"Hi, Ray. How've you been?"

"Fine. Hey uh . . . . . uh, well I got your card." Why the hell had he said that, he thought! He cursed himself quietly.

"Uh . . . . well how about going to a party at Denny's tomorrow night?"

"I'm sorry, I can't," Her voice sounded cold and unpleasant.

"Oh . . . . well okay. Maybe I'll see you around."

"Sure, and thanks anyway. 'Bye."

"'Bye."

He slammed the receiver down loudly, hating himself welling up inside. "Why? Why did I tell her I got her card? Of all the damned fool things to say! She must think you're off your damned nut."

The room preseed in on him and the air seemed to have a quiet loneliness that clawed at his insides. He went to the hall closet and grabbed his jacket off the hook. He flung the door open and stepped out into the night, and slammed the door behind him.

A steady, freezing rain pelted him as he looked down the bleak, empty street. He turned his head toward the park and stared at the angel, white and glowing in the light, the hole staring from beneath the hands. His voice shrieked through the driving rain, through the lonely, nervous night.

"Why the hell doesn't somebody fix that damned hole?"

He looked around quickly, fearing that someone might have heard him. A feeling of guilt swept over him; guilt from what, he did not know. It probably wouldn't do any good to fix the hole anyway, he thought. There's always another rock to throw.

TWO POEMS

Michael Robert Rigolizzo '64

Someday!

I ask no promises,
No tender whispered vow.
If you must go, you go,
And I'll not hold you now.

But someday when these fires
No longer brightly burn,
You will remember me . . .
And then, you will return.

The Owed to a Herse

The Long jack went away,
A big door fell down,
The crazy light ran wild,
An Old tray sat foolly,
But big Herse came through.

A pretty curtain flew bad,
The little window is big,
A black flame came home,
A round book caught squares,
But big Herse came through.

A curved bend walked long,
A small pen inked flat,
An empty chair rose back,
The funny ball stood up,
But big Herse came through.

APPLIED ECOLOGY

ON EARTH . . . IN SPACE

The Earth as a Closed Macroscopic Ecology

"Ecology is the relationship of organisms or groups of organisms to their environment."[6]

Living organisms and their non-living environment are inseparably interrelated and interact upon each other. "Any area of nature that includes living substances interacting to produce an exchange of materials between the living and non-living parts is an ecological system."

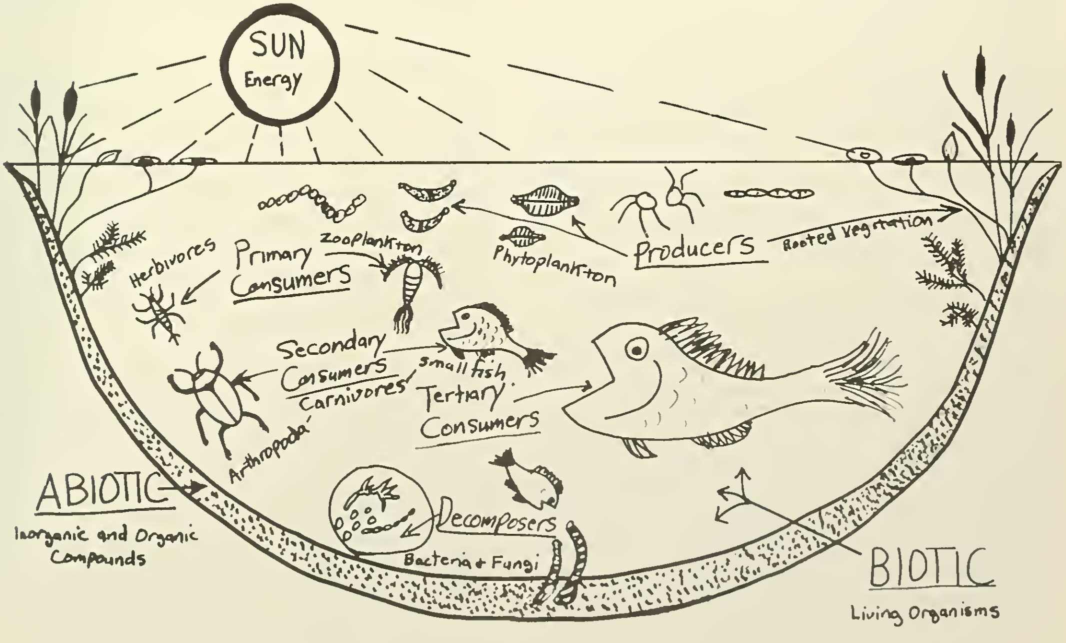
An ecological system has two components; an autotrophic (self-nourishing) component, in which fixation of light energy, the use of simple inorganic compounds, and the buildup of complex substances predominate; and a heterotrophic component (other-nourishing) in which utilization, rearrangement, and decomposition of complex materials is predominant.

"The four constituents which comprise an ecological system are the non-living substances (abiotic), the producers, consumers and decomposers. The latter three are living substances, biotic. The abiotic substances are basic organic and inorganic chemical compounds. The producers are autotrophic organisms, largely green plants which are able to manufacture or photosynthesize food from abiotic substances. The consumers (or macro-consumers) which are heterotrophic organisms, ingest other organisms or particulate organic matter. The decomposers are micro-consumers, chiefly bacteria and fungi, which break down complex compounds of dead protoplasm, absorb some of the decomposition products and release simple substances useable by the producers."[6]

An example of an ecological system within earth's macroecological system is a pond (as depicted in Fig 1) Within a pond the abiotic substances are the basic organic and inorganic substances such as water, carbon dioxide, oxygen, calcium, nitrogen, phosphorus salts amino and humic acids. A small portion of the vital nutrients are in solution and are immediately available to organisms. However, a much larger portion is held in reserve as particulate matter as well as in the organisms themselves. The rate of release of the nutrients from the organisms is one of the most important processes which regulates the function of the entire system. The *producers* are rooted, or large floating plants, generally growing in shallow water, and minute floating plants, usually algae (called phytoplankton), which are distributed throughout the pond as deep as light can penetrate.

There are three groups of consumers: the insect larvae and crustacea, which are considered *primary* consumers (herbivores) because they feed directly on the producers; *secondary* consumers (the small carnivores–arth-

Figure 1
POND ECOSYSTEM



ropoda and smaller fish) which feed on the primary consumers; and *tertiary* consumers (the large carnivores—the large fish) which feed on the secondary consumers. The decomposers, bacteria and fungi are distributed throughout the pond, being available where the bodies of plants and animals accumulate, and where plankton and rooted vegetation are abundant. When temperature conditions are favorable decomposition occurs rapidly; dead organisms are broken into nutrients, and released for re-use by the *producers.* This system is a completely self-sustaining cycle, sunlight being the only external source of energy.

Variation in rates of chemical and biological activity may produce changes within this particular community. The producers (green plants) serve an additional function in the pond system. *Plants* require carbon dioxide to carry on photosythesis. In the process, they give up oxygen as a by-product, and in so doing replenish the oxygen of the system. In effect then both the biotic and abiotic components of the ecosystem determine its character.

Man, as a living organism differs from other inhabitants in this ecosystem in that he has effected changes which are contrary to the natural evolutionary character of the system. The relative intelligence and creativity of man, while enabling him to adapt an environment to his advantage, has in many instances created an imbalance. He has initiated favorable (for himself) evolutionary changes within his community that have improved his rate of survival and his longevity. This "favorable" ecological imbalance, however, is fast being diminished as a result of increasing population, the accompanying gross physiological needs, and the self-limiting sources through which he now satisfies them. This has motivated him to seek new sources of food.

In every case, the original source of food supply of animals is the green plant. Man is therefore dependent for his food production on the photosynthetic capacity of an area of land. In the past increased food production has been attained through the cultivation of more and more land. Land cultivation has been intensified by the development of machinery, scientific application of fertilizers, the development of improved and adaptive genetic strains (both plant and animal) and the control of diseases and pests. The fundamental process of trapping the sun's energy through photosynthesis is still, however, the primary synthetic force.

In considering the organic material synthesized by the higher plants, it is important to recognize that only one half is in the form ordinarily considered food. The portions of plants on which man presently relies for food are seeds, tubers, and other storage organs which are derived from a small portion of the plant kingdom, and are mainly land plants. The plants which man uses as a source of food are characterized by the small amount that is edible and the considerable portion of the synthesized food being utilized by the plants for their own maintenance and growth. The rate of plant development during the growing season is such that they must be considered inefficient utilizers of solar energy. This is exemplified by some of our major grain crops, wheat, barley and oats. The seeds are planted in the soil where they germinate and begin to grow. In the first six weeks of growth only one-fourth of the maximal leaf surface is developed; in the two weeks that follow, an additional fourth is developed; and in the ninth week, the final half is attained leaving only two to three weeks for the plant to manufacture organic material at its maximal capacity"[1]

In 1948 an investigation of algae by Spoehr and Milner showed that the composition of algae such as *Chlorella Pyrenoidosa* could be controlled. This stimulated interest in the possibility of using algae as a source of human food.

The inefficiency of the higher plants as photosynthetic machines has been pointed out. In contrast to these organisms, lower forms of plant life may present some advantages. Unicellular algae are relatively highly efficient photosynthesizers. Each cell contains a large amount of chlorophyll which is essential for light utilization. The organic materials produced are stored within each cell wall. The growth in the lower forms occurs through the division of each cell into 4, 8 or 16 new cells every twelve hours, each cell being capable of photosynthesis. Its growing period is without limit: it may be harvested continually at its peak of nutritional quality; and the entire cell is nutritionally valuable. The lower organisms of this group, of which *Chlorella* has been given the most attention, have a remarkable feature in that their composition can be controlled with regard to protein, fat and carbohydrate by variations in their nutrient media.

A number of species of macroscopic marine algae have been, and are presently being used as food. Along the coast of Europe, *Laminaria* are regularly collected, dried, and used as cattle fodder. In Japan, *Porphyra* seaweeds have been considered a delicacy for centuries. In the United States *Chandrus Crispus,* or Irish moss, is harvested commercially along the New England coast for use in puddings and other food products. Since there is a great deal of similarity in the general chemical nature of all algae it is assumed that microscopic algae are also suitable as a human food.

"In 1941, Jorgen Jorgenson received permission from the Venezuelian government to maintain experimental cultures of fresh water algae taken from Lake Maracaibo and to test their nutritional value on lepers in the Cabo Blanco Leprosarium. The algae was fed in the form of a soup which was boiled for twenty minutes with salt added to improve the flavor. The cultures consisted of a heterogenous group as they occured naturally in the lake. The patients varied in ages from 8 to 70 years old and in poor general health. The daily dosage was 400 ml. for children and 600 ml. for adults, fed as an accessory food. Observations taken after three years of feeding showed no ill effects; on the contrary, in a majority of the cases increased energy, weight and general health resulted."[1]

Since 1941 many experiments have been performed with algae to determine their nutritional value, productivity, methods of cultivation, and feasability of production. The primary interest has been in the class of green algae (chlorophyta), specifically, unicellular *Chlorella.*

Interest in microscopic chlorella as a food is due to their high protein content. The percentage of protein in *Chlorella pyrenoidosa* is directly related to the environmental conditions during growth. It is possible to control those conditions so that a protein content of 50% of dry weight can be obtained." An assay of the protein for individual amino acids exhibited all essential amino acids with a slight deficiency in methionine. The carbohydrate varied from 15 to 33% of the dry weight and consisted of sucrose, starch, free reducing sugars, soluble and insoluble polysaccharides. The fat or lipid content varied from 23 to 75% of dry weight, containing palmitic, stearic, and a large number of C16 and C18 unsaturated fatty acids. The mineral content of algal ash was determined by the ratio of calcium, magnesium, potassium and sodium ions in the growth medium. Analysis of the vitamin content of *Chlorella* indicates it is an important potential source of vitamins for the human diet. One quarter of a pound of dried *Chlorella* would provide more than the minimum daily requirement of all vitamins except vitamin C, which is present in large quantities, but is lost in drying."[1]

Nutritional tests with *Scendesmus* algae, egg protein and milk, yielded equal growth in weaning rats for the first hundred days after which the algae appeared to be better than the other proteins. No amino acid supplement was needed with the algal diet and no ill effects were observed after 240 days of feeding. Other similar nutritional experiments did not report any greater benefit from the algae diet, but did demonstrate that algae could be used as a complete diet.

"If half the per capita requirement of 65 grams of protein was to be obtained from algae, then it is estimated that a million acres or less would feed the present world population."[1]

This amount of land is relatively insignificant and would not displace any existing argicultural crops. Land unsuitable for conventional agriculture could be used. The calculated annual yield of algae is higher than that of conventional crops. For example, a comparison of the protein content of algae with soybeans shows the following: one acre in one year would produce 40 tons of dried algae of which 20 tons would be protein as against 0.75 tons of soybeans of which 0.25 tons would be protein. An algae crop will yield more fat, protein, and carbohydrates than all conventional crops except seeds.

Our present knowledge indicates algae has a tremendous potential as a source of food for meeting the needs of an ever-enlarging population. The promising results have provided impetus for a continued and more thorough investigation of algae. A great deal of additional information will be needed to determine the optimum algal culture, quantity of light, carbon dioxide, growth temperature, nutrient media, methods of harvesting and processing algae. Research is presently being performed by government-supported programs in the U.S. and abroad.

The Spaceship—A Micro-Ecological System

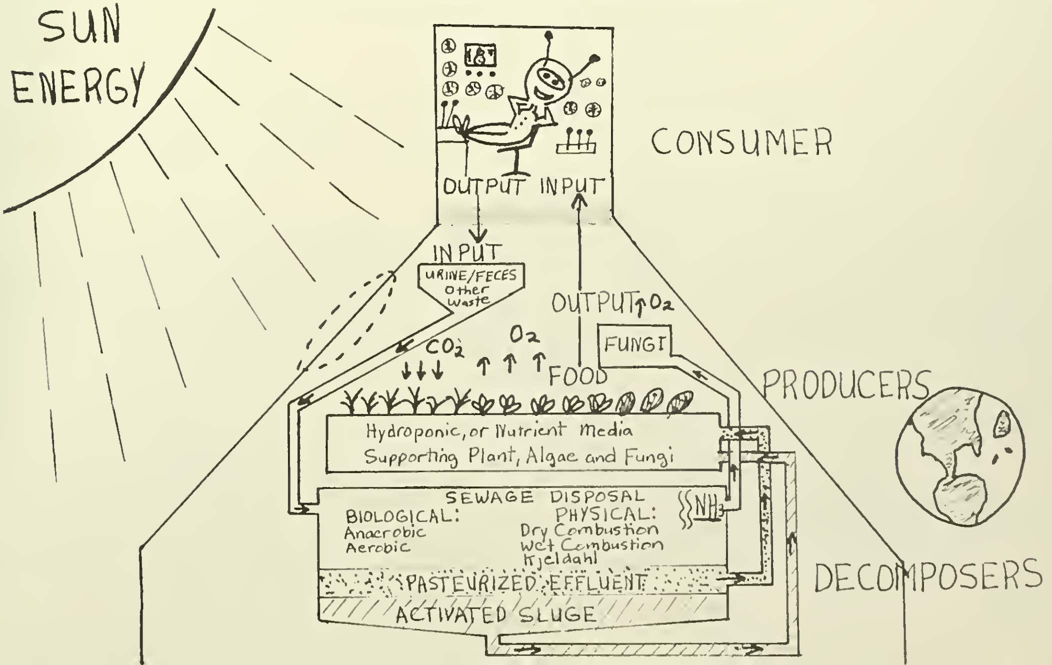
Our studies of algae, their highly significant potential as a source of food, and the fact that "crops" of algae can be produced in a closed self-sustained system, raise interesting questions about incorporating such a food-generating system in our future space ships.

In traveling long distances people formerly had to carry food to sustain themselves. The advent of modern transportation removed this necessity. Once again, however, this need for sustenance has become important in connection with man's interplanetary travel. The advances made in the past five years and the projected plans for the next ten years call for investigation of our planetary system. Included among the technological problems involving inter-planetary flight are the ever-present physiological requirements of man. Man in space will still require food, oxygen, and water.

The most obvious solution would be to have man take these necessities with him. This would be practical only when applied to short duration flights. However, for long

Figure 2

SELF SUPPORTING SPACE ENVIRONMENT



space probes this would be impractical because it is estimated that 200 tons of fuel would be required to transport one ton of food, water, and oxygen to the moon; and the quantity of food required to sustain a crew of four for an eight month trip to Venus would weigh more than the space craft itself. The solution suggested is to simulate man's terrestrial environment, partially or totally, depending on the trip's duration.

Government supported studies at the General Electric Company, and the Martin Aircraft Corp. have indicated that a miniature self-supporting ecological system away from the earth within which space travelers will be able to survive for long periods of time, without the replenishment of a single molecule of food, water, or air from the earth, is practical."[2] This, and similar systems are presently under investigation.

The most recently developed systems under investigation are the physiochemical and the bio-regenerating. The physiochemical system is a closed system that necessitates an input of food. Such a system is proposed for trips of short duration. The liquid, solid, and gaseous wastes would be "reworked" by physical and chemical means to provide the needed oxygen and water for the system.

For extended trips, or living on a space platform, the physiochemical system, supplemented by a bio-regenerating component could make man completely self-sustaining while living in space. The combined physiochemical-bioregentating system would contain four compartments: 1) water and oxygen; 2) space for men; 3) sewage disposal; 4) and the photosynthetic gas exchange. Fig 2 is a highly abbreviated sketch of such a system in a capsule.

All recent periodicals are alive with interest and speculation. It is pointed out, however, that much research is still needed, and the researchers themselves are vague as to when such a system might be put into operation. We have, however, put man into space, and the chances are good that we shall be able to provide the sustenance to keep him there for long periods. A micro ecological system may well provide the food for an out-of-this-world cuisine.

BIBLIOGRAPHY

[1] Burlew, John S. (editor) *Algal Culture: From Laboratory to Pilot Plant*, Carnegie Institute of Washington Publication 600, Washington, D. C., 1953.

[2] Casey, Richard P. and Joseph A. Lubitz. *Algae as a Food for Space Travel*, Food Technology, Vol. 7, No. 11 (Nov. 1963).

[3] Fogg, G. E. *The Metabolism of Algae*, New York; John Wiley and Sons, Inc. (1953).

[4] Lachance, Paul A. and John Vanderveen. Problems in *Space Foods and Nutrition; Foods for Extended Space Travel and Habitation*, Food Technology, Vol. 17, No. 5 (May, 1963).

[5] MacDougall, Mary Stuart and Robert Hegner, *Biology, the Science of Life*, McGraw-Hill Company, Inc., New York, 1943.

[6] Odum, Eugene P. *Fundamentals of Ecology*, W. B. Saunders Company, Philadelphia and London, 1953.

[7] *You Can Live on Your Waste*, Science Digest, Vol. 55, No. 2 (February, 1964).

[8] *Food For Space Feeding.* Food Engineering, Vol. 36, No. 2 (February, 1964).

The closing words from the Commencement Address of Dr. Millard E. Gladfelter, President of Temple University, at Delaware Valley College, May 24, 1964: "For you then, who find satisfaction in being close to the soil from which life springs and to life itself, our fondest wish could be that

"the hopes that you hope,
And the dreams that you dream,
And the things you are wanting to do,
Be planted as seed and take root in this world,
And make it a garden for you.

Let there be a few weeds,
Just the veriest few,
To mess up the garden a bit
That you may care to plant it again
And learn to appreciate it.

And then when life's frost—
As often it does—
Makes bare where your garden has been;
You may turn to your friends, the red-blooded kind
Who will help you to plant it again."

(The literal translation of the inscription on the Seal of the College is, "Life comes from the Soil." We are grateful to Dr. Gladfelter for an inspiration that recalls, so forcefully, this simple truth)

MEDICINE AND THE LAW

Anthony Schiro '65

The fields of medicine and law are far apart in many respects, but in recent years they have been drawn together more and more. Medicine concerns itself with the physical welfare of man, whereas man's relationship with other men and society is the prime concern of the law. The realtionships between physical well-being and proper social behavior is obviously a close one. Behavior, which is of equal concern to the doctor and lawyer, certainly cuts across the fields of medicine and law, carving a wide area in which the action of the individual can be weighed, his accountability measured, and society's treatment of him measured only by combining, focusing and harmonizing medical and legal views.

Let's discuss briefly some of the areas where law and medicine meet. Let us also look at areas where the two fields stand apart. An interesting place to begin our observation is the beginning of human life. It is difficult to explain briefly the tremendous medical knowledge and concern for embryonic life. Many of our older laws are highly inadequate in this area of medicine. Until recently, as far as the law was concerned no notice was taken of the existence of life before birth. Legally it did not exist. Under this condition if a fetus still in its mothers womb suffered an injury through the act of another, which at birth resulted in a maimed or crippled infant, there was no right of action against the wrongdoer. In case you are thinking that these conditions existed before your time let me add that this was the law of New York State by judicial decision until 1953. At that time, the law finally caught up with reality.

Perhaps it would be well to deal with a more common meeting ground of lawyers and doctors, such as the field of personal injury cases and the specialized area of workmen's compensation. It is in this area that the legal solutions depend to a great extent upon the medical facts and indicated medical remedies.

The legal decisions handed down in many cases are determined largely by the nature and extent of injuries, the resulting incapacity, the treatment required for recovery and the expenses incurred while recovering. Medical testimony thus looms large in trials of personal injury cases and consideration of claims for workmen's compensation cases.

Many times when a lawsuit is tried to completion rather than settled along the way the prime confusions and disputes are concerned with the injuries themselves. The medical "facts" are usually not beyond controversy. One doctor makes one diagnosis and prognosis or theory of the course and final result of the disorder while another doctor is prepared to make quite a different diagnosis and prognosis. In many cases it would seem that they were not talking about the same case, the difference between them exceeding one of degree and becoming even one of the existence of any injury at all, such as a brain injury or even a skull fracture. Of greater sublety is the determination of a person's sanity at a particular time as can be adequately illustrated by the current Jack Ruby trial. It is quite obvious that the defense' inability to prove a degree of insanity, in one form or another had a great bearing on the court's decision. Injuries to the head have become a fruitful area of litigation. Here there are wide professional differences in medical testimony, because the presence, absence or extent of injury cannot generally be observed or demonstrated and opinion can vary with the imagination or interest of the person giving testimony.

There are tests that will show abnormal conditions but so many disorders are so vague, such as insomnia or personality change, that verification is impossible and there is a great deal of room for honest differences of opinion as well as exaggeration and falsification. Under these conditions there is more involved than just the monetary awards; there is also the competency and honesty of the medical experts as well as the scruples of the lawyers.

Unfortunately, some doctors specialize in giving expert testimony in personal injury litigation and tend to become "expert testifiers." The result, then, is not objective medical analysis, but the doctors' ability to persuade a jury, for a slight remuneration, of course. On the other hand expert medical opinion is needed and sincere physicians should always be willing to cooperate in giving objective medical opinion.

In line with this thinking, the New York Academy of Medicine and the New York County Medical Society set up a panel of outstanding, independent medical experts to be available to the courts. The advantage in this is that such a group would have no connection with any of the parties involved. Since none of the parties involved would contribute any compensation to the panel, the Alfred P. Sloan Foundation and the Ford Motor Company Fund agreed to underwrite the program for a trial period. The result has been that cases have been disposed of in shorter time and on a sounder basis than if left to partisan medical experts and lawyers. Probably the next step in furthering this highly worthwhile venture is to incorporate it more fully into our judicial inquiry and legal system which handles cases so complex that they cannot be viewed by any mere judicial screening or settled by any court order. The ordinary concept and function of a criminal court is to determine guilt or innocence, and, if the finding is one of guilt, to impose an appropriate sentence. As more and more judges are realizing, the determination of guilt or innocence of most youthful offenders is incidental to any proper consideration of the case. The important considerations are the causes and conditions which involved the youth in crime and, in light of this, what rehabilatory measures can be taken. In the courts which deal with youthful offenders there is very little aid, although every intelligent judge knows the roots of many youthful crimes lie in physical and mental conditions and that medical aid is needed for diagnosis and treatment of the offender. In both aspects of causation and remedial measures, general medical, psychoanalytic, and psychiatric services are required.

There is, in all the facts presented, a challenging opportunity for the professions of medicine and law to join in designing, planning and administering a basic program of social health.

A PILOT BORN

Michael Robert Rigolizzo '64

It was Saturday morning, time and date unimportant. The wind was from the west at five knots. I found myself in the cockpit of an airplane while my instructor was standing with the prop in his hands. It was a very cold morning and the turf runway was hard. The instructor revolved the prop a few times and shouted, "Brakes and contact." Instinctively, I found my feet pressing heavily on the brakes, and my left hand danced to the side panel and moved the mag switch from "Off" to "Both" – a standard procedure that I had learned during my previous nine hours of flight time. "Mission accomplished," I shouted back, "Brakes and contact." With one powerful downward thrust, the instructor converted the inanimate mass of machinery to a live pulsating "being" ready to respond to my every command.

At the end of the runway, I quickened the engine's rpm's to check out all instruments. All responding "A-OK," my instructor said, "It's all yours. Take off, fly around the pattern and land. Don't forget. I left my stick at the gas pump; I can't help you, and I'm too young to die."

I knew he was kidding me about the stick, but I also knew he wasn't going to help me. Anxiously, I poured on the coal, kept the nose of the plane straight with the rudders, and eased the stick forward to raise the tail. When I achieved flying speed, I eased back on the stick—and was airborne!

I flew around the pattern and brought the plane in for a beautiful landing. Not a word from my instructor. I turned the plane around and performed the same procedure a second and a third time. As I prepared for the fourth trip around, the instructor opened the door and got out. I thought something was wrong, but he smiled and put out his hand. Shaking my hand, he said, "You're now a pilot, son; I'm proud of you. It's all yours; take it around and remember: it's got to look right and feel right. If it doesn't, make a go-around. Good luck!" I nodded my head in acknowledgment and closed the door.

Lining up the airplane with the runway, I faltered there a few seconds. I thought, "Is this really what I want?" A definite, inescapable "Yes" flashed before me. I thought of the possibility of making one mistake to end a short life. That thought left my mind as quickly as it had entered. With sweaty hands, I pushed the throttle all the way forward. Observing the movement, and feeling the surge of power, I worked at the rudders: *I must keep the plane straight while on the ground!* An airplane on the ground is like a fish out of water – it wasn't meant to be.

The airplane is now very much alive: it becomes a part of me; I'm no longer man; the airplane is no longer airplane. Together we are one; we are man-airplane. I have a love for my airplane. We can conquer earth's gravity, and leave behind the massive confused societies of the world. Together we have great freedom. My airplane, in return for my love, is obedient and true to me and respects me, but if I carelessly treat her wrong or hard, she will, one day, very dispassionately kill me and herself. However, she knows that I will try always to treat her right, and I feel secure, for she will treat me right—a captivating love affinity.

I ease the stick forward and feel the tail of the plane respond to my command. With fast-gaining speed, and the approach to take-off velocity, I ease the stick back. The control movements are positive yet gentle; they can't be harsh and jerky. With a little back-pressure on the stick, I am airborne! I keep the plane about three feet above the ground until I build up an adequate airspeed. This is important: given enough airspeed, the plane will respond to any maneuver I want it to perform.

As I approached the end of the runway, I applied greater back-pressure on the stick and climbed up to 400 feet. All looked right, and all felt right. I made a gentle 90 degree turn and climbed to 600 feet. With all "A-OK"—in the green—I made a similar turn and climbed to 800 feet. I maintained this altitude by reducing the rpm's, and with a slight increase of back-pressure on the stick.

For the first time, I looked at the back seat. It was very very empty; and, for the first time, a sudden fear and chill seized me as I realized I was alone—and desolate. But then, somehow a smile came to my face for I experienced feelings which will live within me always—feelings of pride, accomplishment, freedom, courage, tenderness, and love. Here I am, World, alone on my towering pedestal with the environmental surroundings of nature, the beautiful. Conqueror and King—my airplane and I—together we fly—together we die! Long live the King!

At ten o'clock low, the airstrip on which we would land was predominant. My left hand performed its familiar dance as I turned on the heater to prevent icing in the carburetor. Parallel to the point of touchdown, I cut my throttle and entered a straight-ahead glide. I didn't have much time to think; there was too much to do in too short a time. At 600 feet, I performed a 90 degree gliding turn to the left. I maintained this heading down to 400 feet, adjusting all the while for the best-rate-of-descent gliding speed, the speed that permits the plane to glide the furthest with the least loss of altitude. At 400 feet, I made a 90 degree turn to the left, and pierced my final approach. With the runway directly ahead, I quickly checked all instruments—all "A-OK"—left: one mission to complete—landing!

All looked right, and all felt right. I worked the rudders and ailerons to keep the nose of the plane pointed in the middle of the runway. I worked at the airspeed to keep it constant: lowered for a few seconds, it meant a loss of flying speed, a stall, and possible death; increased too much, it meant too hard a landing. Down to thirty feet! With the end of the runway approaching, I labored, indeed: come on boy—keep it straight! Left rudder and aileron . . . . that's it . . . . hold it right there . . . .GOOD!

Five feet above the ground . . . . keep her straight and level. Now—increase the back pressure on the stick. Back . . . . back . . . . easy now . . . . that's it. Up on that wing . . . . hit left rudder . . . . back . . . . back! The stick's all the way back, pressing against my stomach, and then I feel the gentleness of the rubber passionately kissing the hard earth.

With a big smile on my face, hands still sweaty, stick still all the way back, I roll to a stop.

Mwangi Maganjo

Mwangi Maganjo was born in Gathanga village in the Fort Hill district of Kenya. It was in this village that he received his elementary education.

Over the years Mwangi developed a sincere interest in obtaining an education overseas, especially in the United States. His dream came true when, in 1959, he came in contact with an American lady who was working in the adult literacy program in Kenya.

Through her help, he was able to attend the American high school in Tangier, Morocco, and it was at this school that he received his first two years of high school education. It was also at this school that he had his first experience in international education since the student body was composed of students of various nationalities. He found the experience so rewarding that, at the close of the 1960 school year, he decided to go to a work camp in France. At this camp, he not only had the opportunity to meet youths from all over Europe, but he and his colleagues had the added satisfaction of aiding a nearby community to rebuild a church that had been destroyed during World War II.

In 1961 Mwangi came to the United States and attended a high school in Indianapolis, Indiana, for one semester. He then transferred to Sayville Long Island High School for the remainder of his high school education.

Mwangi has always been interested in agriculture and therefore applied to Delaware Valley College. After graduation, Mwangi plans to return to Kenya and teach agriculture.

KENYA

Mwangi Maganjo '67

Lying on the east coast of Africa and bisected by the Equator, Kenya is bounded on the north by Ethiopia and the Sudan, on the west by Uganda; on the south by Tanganyika; and on the east by the Somali Republic and the Indian Ocean. The country which comprises some 225,000 square miles is the most recent to attain its independence in Africa.

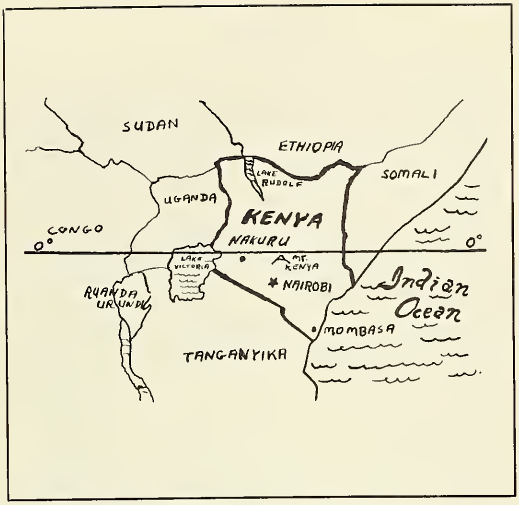
Though Kenya lies astride the Equator its climate is not as hot as one would expect. The coastal belt, considered the hottest region, has a mean shade temperature of 80°F. As one travels from the coast to the interior the climate becomes cooler. The central part of the country, known as the Kenya Highlands, consists of alternating mountain ranges and high level plateaus. These plateaus are at elevations varying from 3,000 ft to 9,000 ft. while the mountains are of greater altitude. Mount Kenya, after which the country is named, is 17,040 ft. high, and is capped by perpetual snow and ice. Other notable mountains in this area include Mount Elgon, 14,000 ft., Aberdare Range 13,000 ft., and the Mau Escarpment, 10,000 ft. high. Nairobi, the capital city, is located at an elevation of 5,500 ft. In the Highland area the air is invigorating, with cool breezes and cold nights, especially from June to August. The country's average annual rainfall ranges from a low of 10 inches in some parts to a high of 80 inches in others.

A population census taken in 1962 revealed that the total population is 8,676,000, of which well over 8,000,000 are Africans, with 182,000 Asians, 63,000 Europeans, and 4,000 Arabs. The African population is composed of different tribes whose languages differ from dialects to totally new languages. Owing to this fact the teaching of Swahili, a language which originated when the Arabs came in contact with the Africans, is encouraged throughout the country. It is hoped that Swahili will become the national language not only of Kenya but of East Africa as a whole—an enormous territory consisting of Kenya, Uganda, Tanganyika, and the island of Zanzibar.

The basis of Kenya's economy is agriculture. Among its principal products are coffee, tea, sisal, meat, pyrethrum, hides and skins, maize, and wheat. The existing industries are based on processing these products.

Second largest source of Kenya's revenue is the tourits trade, with between 40,000 and 50,000 visitors a year coming to see the country's wildlife and scenery.

A view of the national parliament building in Nairobi.



Great attraction to tourists are the seven National Parks: Tsavo, the largest, which covers some 8,000 square miles, Mount Kenya National Park, and the Aberdare Park. A wide variety of game can be seen in all these parks. Contrary to what the movies would make us believe, the people do not live side by side with the wild animals.

In recent years education in Kenya has been integrated at all levels from university down to primary schools. Although education is not compulsory for Africans, Kenya has one of the highest rates of primary education in Africa. The number of high schools has increased appreciably in recent years, but there remains a big need for colleges and universities. As a result of this need a large number of students with insatiable desire for further education have left Kenya for studies abroad.

The future of Kenya is exciting and promising. It is promising because her people, with all their different backgrounds, are willing to join hands and fight against ignorance, poverty, and diseases, which are their greatest and immediate enemies. The country has an immense agricultural potential and the majority of her peoples are throwing in their lot towards its development.

CROSSWORD PUZZLE

Michael Robert Rigolizzo '64

1	2	3	■	4	5	6	■	7	8	9	10	11
12			■	13			■	14				
15			16									
■	17						■	18			■	■
19	■	20			■	21	22		■	23	24	25
26	27			■	28	■		■	29			
30			■	31		32		33	■	34		
■	■	35	36						37		■	
38	39				■		■	40				
41				■	42		43	■	44		■	■
45				46							47	48
49			■	50		■		■	51			
52			■	53		■	54				■	

ACROSS
1. Extinct bird
4. Potato part
7. Prince of
12. . nog
13. Reposed
14. Prevent
15. Broadway (three words)
17. Geologic period
18. Silkworm
20. Conifer
21. Memorable play
23. Resort
26. Polar explorer
29. Scarlet O'Hara's plantation
30. Quilting ....
31. Rio de la ....
34. Neither
35. Amoeba's locomotory mechanism
38. John Jacob ....
40. Parolee (slang)
41. Emote
42. Chesspieces
44. .... Jolson
45. Secretor of ptyalin (two words)
49. Beverage
50. Neuter pronoun
51. . ... age
52. " , we have no bananas"
53. Symbol for calcium
54. Ivory

DOWN
1. English Princess
2. Monster
3. Mesozoic (three words)
4. Organic compound
5. Gape
6. Anaesthetic
7. "By the shining big sea .... "
8. Verify
9. Meriwether and William (three words)
10. Epoch
11. Animal enclosure
16. Sour
19. . ... tide
22. "Do . ... others"
24. For
25. .... Burr
27. ". . ..... merry gentlemen"
28. Asian ....
31. .... capita
32. Snake
33. Mimic
36. Fruit dots on fern fronds
37. Shamrock genus
38. Analysis
39. Rancid
42. .... Hari
43. No, in the Kremlin
46. ... . serxas
47. . ... dice
48. Chemical basis for life

(Answers on Page 19)

Old Men

V. J. Brown '64

Where does it go; from whence does it come?
Put some in containers, bottle me some!
Weigh it; or in any way define it, son.
Look at my wrinkles, bending bones; I am eighty one.

When youth was my forsaken wealth,
And troubles were things that old folks felt,
I spent a fleeting span of time to think on health;
And how the atmosphere would weigh me down one day.

Its nothing growing old I said,
Natural thing—some day I'll just be dead—
A long way past my passions,
I'll go to bed, just once, to stay there dead.

Now, when I say they don't understand,
Or respect or appreciate;
I speak to myself—of a much earlier date.

I have grown old—I am here now.
What I have learned I could not predict.
My friends and peers now show their years:
Or have them tucked in cold dark biers.

Their changes and emotions, by intuition,
I can see. Yes, intuition, thank you so,
They'd never willfully to me show.
Lest I should think them old: Silly boys!
What are men but boys with beards?

Old John, he plays at youth, misleads himself,
Oblivious to fate, daily tries to rejuvenate.
Won't accept it—finds things hard,
But smiles, smokes, and winks at girls,
Talks of when he held their curls.

Elmer, once tall and strong—harsh because
It's now all gone. Grits his crooked teeth
And shakes his shakey hand, but really somehow
Is not envious of the quick and smart young man.
In all his hours that still remain, he'll ward
It off, you'll never see him carry a cane!
Sometimes, in solitude, he might think he
Hears himself say—I'm just an angry old man.
Is it the moment of truth? Has he seen his day?

Furrow-browed Mac regrets his yield of oats;
Wishes the conservative hours of youth were fewer—
Too much of a talker; not much of a doer.
Those were the good old days—when really nothing
Was done, 'cept being young. Complacent, now,
He has long forgotten, so he says, his goals
Of those old days. No longer starry eyed, but
Still there remains an opalescent twinkle
To his hooded gaze.

From the start, seconds closer to the end,
Feels feet falling in cadence—subtle terror to old Gin.
Youthful sins forgotten by him, now he condemns,
Doubts of Heaven now clearly gone—
Must exist to keep him strong.
Wants something here, deserves a tear.
What will he leave?
I know he likes trees.

PHOENIX

William M. Jones '65

He opened his eyes slowly and groaned as he felt a sharp pain at the base of his skull. He blinked rapidly, trying to straighten the whirling images before him.

"Good afternoon."

The voice startled him. His eyes focused on a small, barred window, and behind it a face.

"What the hell . . . .?"

"Please allow me to explain," said the face. "I found you this morning in the forest a mile south of here. You were sitting on a stump, sleeping, with a rifle on your lap. I assumed you had been deer hunting and had fallen asleep. I crept up behind you and struck you on the back of the head with the butt of my shotgun. I removed everything from your pockets and brought you here. It is now two o'clock in the afternoon."

He winced from the pain in his head. He could not speak for several moments. Finally, "Well, now that you've had your little joke, I think I'll be leaving."

"I'm afraid not. You see, I plan on keeping you here."

"What d'ya mean, '*Keep me here*'?"

"Just that. You see, I am a collector of animals. I consider my collection a good one. I keep a very representative group of species. You are indeed a very good catch."

"My God, you talk like I were some kind of animal."

"Aren't you?"

"No."

"Then what are you?"

"I'm a man."

"That is not very likely."

"Are you crazy? You can't keep me locked up here."

"But I'm afraid you are wrong. I can keep you here and I will. I must leave now. You will be given food twice a day, at eight in the morning and at five in the afternoon. Your cage will be cleaned once a week."

"You crazy fool, I'm a man."

"You are an animal. Good day."

He stared at the window for minutes after the face had disappeared. Rising slowly to his feet, he looked over his cage. It was small, about eight feet square, with a ceiling about seven feet high. The walls were of concrete block and the door of solid oak. The floor was thickly covered with oat straw. He walked to the window, still shaky with pain. The only thing he could see was a thick forest beginning only ten feet from the door.

"Impossible," he thought. "This place is built like a rock."

He sat down in a corner and stared at a wall. It frightened him to think and so he did not think. And that is the way he slept; he was afraid to dream.

He was awakened by the sharp clank of the heavy bolt on the door. It opened slowly and his keeper stood on the sill, a piece of beef in one hand and a double barreled shotgun in the other.

"Here is your evening meal," he said, throwing the beef on the floor. "I will bring you water shortly." The door closed and the sound of footsteps faded into silence.

He reached hungrily for the beef. It was cold and raw. Cursing quietly, he threw it against the wall.

The footsteps returned, and a face appeared at the window, the bolt clanked, the door opened and the keeper walked in, the shotgun still clenched tightly in one hand, a dish of water in the other. He set the dish of water down carefully.

"I see that you do not choose to eat your meat. That is to be expected. Most animals do not readily accept captivity."

"You damn fool, I'm a man!"

"What makes you think that? Can you prove that you're a man?"

"What d'ya mean, prove that I'm a man? I can talk; I can think; I can move my thumb."

"Does that make you a man?"

"Yes. If I'm an animal, what are you?"

"What I am you will never know; you are an animal."

"Just get the hell out of here and leave me alone."

"As you wish. Good night."

He slumped back down into the corner. The sunset lit the cage with an almost passionate warmth. His thoughts hit upon a thousand things. Someone would miss him. Someone was probably searching for him right now.

He was sure to be found in a couple of days.

But he was not found in a couple of days. In fact, he was not found in a couple of months. As the time passed, he became used to eating the raw beef, and to the stench of his own excrement. He was given an orange every other morning. The oranges soon became his one joy, his one hope. He would hold one carefully and caress it before he gently peeled it, laying each peel in a neat pile. He would place the seeds along side the peels, as if he were setting them on an altar.

As his altar grew, his hope diminished. He had not talked to his keeper since the third day. He had settled into a morose acceptance of his fate. He could not accustom himself to boredom. He spent long hours humming to himself. But soon the memory of the melodies faded away. He tried making up a game with the orange seeds, but soon gave up.

He was not given anything with which to shave or wash and his appearance grew more appalling each day. His body was black with the dirt of the cage, and the dim light had changed the look of his eyes to a dull, wide stare.

The months passed slowly. Spring had come and perhaps it was the new warmth that brought him back to a realization of what he must be. The morning was just a little brighter, perhaps a little more intense.

The familiar hated face appeared at the door. The keeper entered, the shotgun carelessly slung under one arm, the piece of beef in his hand. He heard the voice of his captive murmur from the darkness of the corner, "I'm a man."

"What was that?"

"I'm a man." The words were barely audible.

"I'm afraid not. You are an animal. Did you hear that? You are an animal."

The captive sprang from the dark corner like a cat at a mouse, a snarl of fury breaking from his throat. The keeper fell to the floor, dropping the shotgun, the captive on his chest. Fingers of steel closed around the keeper's throat, finding the windpipe and pressing it with merciless force. Sensing the other's death, the captive rose slowly and picked up the shotgun. He pointed it at the lifeless form and fired twice. Throwing the shotgun against the wall, he reached down into the torn abdomen of the victim and ripped out a handful of entrails. He turned and walked to the doorway, the entrails still dangling from his hand.

"I'm a Man!" he screamed.

NOTES ON COLOR

(Condensed from article in MD Magazine, Oct. '63)

Anthony H. Mulle '66

Man shares with the birds, reptiles, insects, fishes and his fellow primates the gift of color vision, but only to man is the world of color also a world of magic, emotion, and beauty.

When Londoners repainted Blackfriars Bridge from black to green the number of suicide leaps decreased by thirty-three percent. The association of black with death, or nonlife, and color with life was also shown in an experiment with children. When given black crayons only, they drew inanimate objects such as buildings and vehicles, while when given colored crayons they produced pictures of people, animals, and plants.

On the general belief that red is activating, blue and green tranquilizing, football coach Knut Rochne had his team dressing room painted in red, the visiting teams in blue.

Red causes over-estimation of the size and weight of an object, also of the passage of time; reverse effects are noted with blue and green. The military services warn their drivers to park carefully between two blue cars because the space seems larger than it is.

Interesting are sales figures in consumer goods since color entered into merchandising. In three years after colored telephones were offered, ten million had been sold at ten dollars each; telephone booths painted bright red had six hundred percent more business than drab ones.

Many more observations on color have been made through precise testing. The results confirm that different colors have a definite influence on man's actions and judgements.

THE CAREERS OF THE GRADUATES
of
Delaware Valley College of Science and Agriculture[1]

PETER GLICK JR.[2]

The importance of work to the individual in our society has been documented by a number of authorities who have emphasized the idea in their writings that the average male adult spends more time in his occupation than in any other activity. The adult male America's job, generally occuping about one-third of his day, is much more than merely a means of earning a livelihood or an outlet for his creative energy. In fact, since his own and his family's social position, security, opportunities, choice of friends, economic welfare, and even their attitudes and values are determined to a great extent by the kind of occupation he is engaged in, that work activity significantly influences his own and his family's daily existence more than any other factor or combination of factors.

Currently, when the average male adult is introduced to another, the question that is foremost in both men's minds is not, "What is his nationality?" or "What is his religion?" or "Where does he come from?" but rather, "What does he do for a living?" or "What is his occupation?" Immediately after the latter question has been answered, each man automatically places the other in a specific position complying with the generally acepted, hierarchical arrangement of socio-economic classes.

STATEMENT OF THE PROBLEM

Before the individual becomes involved in the world of work he must make a decision, or a series of decisions, concerning the occupation he expects to follow as a career. This type of decision making, occupational choice, has been defined as ". . . a process which takes place over a period of time and which is best explained by a combination of determinants which themselves interact, are modified, and develop with time"[9]. The college student who makes an occupational choice is, in a sense, not only choosing his life's vocation, but is also determining what he wants and what he expects to get out of life[4]. In a recent study of the occupational values of the undergraduates of this College, it was found that the students viewed work as more than merely a means of earning money when they ranked *Self-Realization* (interesting work that presents an opportunity to use one's special talents and abilities) as the most significantly important determinant of their occupational choices [2].

The necessity of the undergraduate being knowledgeable about the careers engaged in by the graduates of his college can not be overestimated. The importance of being familiar with such information has been discussed frequently in the literature and was very ably summarized a number of years ago when a college dean wrote:

> . . . whatever be the facts with reference to students in the country at large, the vocational (and the college administrator generally) should formulate their policies enlightened by a knowledge of the actual vocational histories of the graduates of their particular institution[6].

The above statement expresses the point of view of the administration of Delaware Valley College which conducts periodic surveys of its graduates for the benefit of its alumni, its undergraduate and its own continuing self-evaluation. The purpose of this article is to present the results of the most recent occupational surveys of the graduates of this College to the administration and the faculty for their use in curriculum development and to the undergraduates and alumni for their use both in making realistic occupational choices and in eventually attaining career satisfaction[3].

METHOD OF CLASSIFYING OCCUPATIONS

The writer's concern with the problem of classification of occupations began when he was in the process of designing a study to determine, among other things, the occupational aspirations and the occupational expectations of this College's undergraduates majoring in agriculture[2]. As college students almost invariably aspire to occupations on the professional and managerial levels, the classification of occupations in accordance with the traditional method used by most researchers into the various socio-economic groupings was recognized as being too limited[1].

Roe had devised a two-dimensional classification of occupations technique that was based on level and group. The level of function dimension was presented in six levels that related to "degrees of responsibility, capacity and skill"[8]. The second dimension included eight areas and was presented as being related to classification of interests. Super combined the two-dimensional approaches of Roe, Standard Industrial, and others into a three-dimensional scheme [9]. He indicated that systems based on the one or two-dimensional approaches were inadequate as they did not describe the occupation completely. His proposed divided field into eight areas, level into six, and enterprise into nine. He explained that the description of an occupation must consider such factors as level of ability required, the field of activity or interest, and the enterprise in which the work activity is actually carried out. In spite of Super's effective theorizing, however, he has continued to use a limited approach in his financially well-supported longitudinal "Career Pattern Studies" being conducted at Columbia University[11]. Finally, the United States Bureau of the Census used a type of three-dimensional approach (industry, occupation, class of worker) in its attempt to index the occupations reported for the 1960 census [12].

---

[1] The data for this article were obtained through the cooperation of the alumni and from the report submitted by the writer in March, 1963 with the assistance of Mrs. Christ, the Alumni Secretary, and Mr. Larsson, the College Registrar.

[2] Director of Graduate Placement and Chairman, Division of General Studies at the College.

The writer's *Three-Dimensional Classification Of Occupations Instrument,* a modification of the Super proposal, was developed from a thorough study of the above approaches. This instrument enables the investigator to index the occupation according to *level, field* and *enterprise. Level,* with six classifications and influenced by Roe [8] and Moser [7], was considered to be a vertical dimension based on the prestige associated with the occupation, the size of income typically earned, the degree of authority wielded, the freedom of action involved, the amount of education required, and the level of intelligence demanded. *Field,* with eight areas and influenced by Super [9], was established as a horizontal dimension related to the work activity involved in the occupation. Finally, *enterprise,* with the twelve areas established by the Bureau of the Census [12], was also a horizontal dimension describing the nature of the business, industry, professional practice, or service. An outline of the instrument is presented in Table 1 below.

TABLE 1

An Outline of the Three-Dimensional Classification of Occupations Instrument[2]

(Based on modifications of Roe[8] and Moser[7] for *level,* Super[9] for *field,* and adoption of the Bureau of Census approach[12] for *enterprise.*)

Level

1. Professional and Managerial, higher.
2. Professional and Managerial, regular.
3. Semi-Professional and Managerial, lower.
4. Skilled.
5. Semi-skilled.
6. Unskilled.

Field

1. Outdoor and Physical Activities.
2. Social and Personal Services Activities.
3. Persuasive Business and Business Contact Activities.
4. Administrative and Administrative Control Activities.
5. Research and Development Activities.
6. Humanistic Activities.
7. Fine Arts Activities.
8. Commercial Arts Activities.

Enterprise

1. Agriculture, Forestry and Fisheries.
2. Mining.
3. Construction.
4. Manufacturing and Processing.
5. Transportation, Communication and other Public Utilities.
6. Wholesale and Retail Trade.
7. Finance, Insurance and Real Estate.
8. Business Repair Services
9. Personal Services.
10. Entertainment and Recreational Services.
11. Professional and Related Services.
12. Government Services.

At this point it should be recognized by the reader that work varies not only according to the *level* it is assigned in our hierarchical arrangement of groups of occupations, but also according to the *field* of activity or interest involved in it and the *enterprise* in which it is carried out. For example, a medical doctor (level—Professional and Managerial, higher or [1], engaged primarily in research work (*field*—Research and Development Activities or [5]) and employed by a federal government agency (*enterprise*—Government or [12]) is pursuing a career that is much different than his classmate who is also a medical doctor (*level*—Professional and Managerial, higher or [1]), but who is engaged primarily in diagnostic and remedial work with patients (*field*—Social and Personal Services Activities or [2]) and who is working in his own private practice (*enterprise* — Professional and Related Services or [11]). Both men are medical doctors, but they are engaged in entirely different work activities and are working for completely different employers. Therefore, the occupations in which they are engaged cannot be considered similar for they differ on two important dimensions, *field* and *enterprise.* The degree of satisfaction the doctors derive from their work might be the same, but the work activities and the employers are different. It should be evident from the above discussion that a clear, concise description of an occupation must include the three dimensions of *level, field* and *enterprise* as any other approach would be incomplete and, therefore, misleading.

THE METHOD

During November, 1963 the six-hundred-and-ninety graduates of the College were mailed a cover letter and an enclosed, self-addressed, stamped card requesting certain occupational and educational information. Four-hundred-and-twenty-six alumni responded to the first mailing. A second request was sent out in January, 1964 and, at the time this article went to the printer, a total of four-hundred-and-seventy-six graduates (approximately 69 per cent) had returned completed cards. The six-hundred-and-sixty-one graduates discussed in this article include both those described above and an additional one-hundred-and-eighty-five alumni covered effectively in the March, 1963 Report[5].

Using the *Three-Dimensional Classification Of Occupations Instrument* in the way explained previously, each occupation listed on the card by an alumnus or listed in the 1963 Report was assigned a code number. For example, the first medical doctor discussed in the example previously cited would have been assigned a code number of 1-5-12, and the second medical doctor would have been classified as 1-2-11.

THE FINDINGS

The findings of the study are described in Tables 2 through 7. Table 2 describes the number and the per cent of graduates distributed within the three levels of occupation. It should be recognized that, just as college students almost always aspire to occupations on the top three levels, so do college graduates generally find themselves engaged in occupations on those higher levels. Application of the Chi-Square test showed that there were significant differences, at the .01 level, in the way the graduates were distributed within the three levels of occupations. The number of graduates in occupations on the second level, Managerial and Professional, regular, is significantly larger than the amount of those reported in the other two levels. This indicates that the alumni are following careers that offer satisfactory financial rewards and that are ranked quite high on the socio-economic prestige scale. The next largest number appear in the third level, Semi-Professional and Managerial, lower.

These men are generally working up the scale in agricultural production as relatively inexperienced farm managers, landscapers or nurserymen, beginning a career in government work in a trainee-type GS 5 rating, or are inexperienced sales representatives in some type of agribusiness. The smallest group are classified in the top level, Professional and Managerial, higher. Most of these alumni have been pursuing their careers for longer than seven years and have acquired experience and, in a number of cases as shown in Table 6, have earned graduate degrees. For a comparatively new college, awarding its first Bachelor of Science degrees in 1950, there are an encouragingly large number of alumni engaged in occupations on the top level. This record appears to document the effectiveness of the College's educational program and the intelligence, ability and ambition of its graduates. It should also be noted that a number of the alumni, presently classified in the second or third level, are showing signs of upward occupational mobility.

TABLE 2

Distribution of six-hundred-and-sixty-one Graduates within the Vertical Levels of Occupations

°Occupational Level	Number of Graduates	°°Approximate Per Cent of Graduates
1. Professional & Managerial, higher	76	11
2. Professional & Managerial, regular	456	69
3. Semi-Professional & Managerial, lower	129	20
Number =	661	100

°No graduates reported occupations in the three lower levels: 4. Skilled; 5. Semi-Skilled; and 6. Unskilled.
°°To the nearest whole number.

Table 3 describes the distribution of the alumni in the horizontal *field* of activity dimension. The largest number are engaged in occupations involved with Social and Personal services (28 per cent) such as teaching, agricultural extension work, graduate school assistantships, and working for farmers' cooperatives. Outdoor and Physical activities (23 per cent) including agricultural production jobs such as owners-operators of farms and ornamental horticulture businesses and farm managers and landscape foremen claim the next largest number of graduates. Persuasive Business and Business Contact activities (19 per cent), including positions in sales and sales management, and Research and Development activities (17 per cent), including actual research and development work, food and drug inspection, quality control, and development of food products, are the third largest groups. Finally, a considerable number of alumni have risen into Administrative and Administrative Control responsibilities (11 per cent) as government, educational and business executives. Application of the Chi-Square test showed that it is statistically significant, at the .01 level, that the graduates were distributed within the *fields* in the manner explained above.

TABLE 3

Distribution of six-hundred-and-sixty-one Graduates within the Horizontal Fields of Occupations

°Occupational Field	Number of Graduates	°°Approximate Per Cent of Graduates
1. Outdoor, Physical Activities	154	23
2. Social & Personal Services Activities	181	28
3. Persuasive Business and Business Contact Activities	126	19
4. Administrative & Administrative Control Activities	70	11
5. Research & Development Activities	114	17
7. Fine Arts Activities	8	1
8. Commercial Arts Activities	8	1
Number =	661	100

°No graduates reported occupations in the sixth, Humanistic Activities field.
°°To the nearest whole number.

Table 4 describes the distribution of the alumni in the horizontal *enterprise* dimension. Application of the Chi-Square test showed that there were statistically significant differences, at the .01 level, in the way the graduates were distributed within the occupational enterprises. It appears that a significantly large enough number of alumni are working in Professional and Related enterprises (28 per cent), Agriculture (21 per cent), Wholesale and Retail Trade (21 per cent), and Government (17 per cent) to consider that extremely important as employers of the College's graduates. The Manufacturing and Processing enterprises (12 per cent), generally large companies engaged in food processing, are also key employers. Within the enterprise dimensions the graduates are generally engaged in teaching (Professional and Related), agribusiness sales (Retail and Wholesale Trade), and federal civil service (Government).

TABLE 4

Distribution of six-hundred-and-sixty-one Graduates within the Horizontal Enterprises of Occupations

°Occupational Enterprise	Number of Graduates	°°Approximate Per Cent of Graduates
1. Agriculture	140	21
3. Construction	5	0
4. Manufacturing and Processing	74	12
5. Transportation, Communication and Other Public Utilities	4	0
6. Wholesale and Retail Trade	141	21
7. Finance, Insurance and Real Estate	10	1
10. Entertainment and Recreational	4	0
11. Professional and Related	182	28
12. Government	111	17
Number =	661	100

°No graduates reported occupations in the following enterprises: 2. Mining; 8. Business Repair; and 9. Household–Personal.
°°To the nearest whole number.

Although it is difficult to describe from these data the typical occupation of an alumnus, one might initially draw the following conclusions: 1. It is in the Professional and Managerial, regular level (*level* 2); 2. It is a position that involves working with people and providing them with Social and Personal services (*field* 2); and 3. The employer is a Professional and Related services type organization (enterprise 11). An example of such an alumnus might be a high school science teacher who has earned or who is about to earn his Master's degree. However, as classification 2 in the *field* dimension includes a wide variety of activities in which the alumni are engaged (teachers, agricultural extension workers and professional people) and classification 11 in the enterprise dimension presents an almost equal diversity (health institutions, educational institutions, architectural organizations, and other professional and related type organizations), the high school science teacher cannot be considered realistically as the typical graduate of the College.

Table 5 below shows that it would probably be more realistic to describe him as one of the following: a sales representative for a company engaged in a phase of agribusiness (19 per cent); the owner-operator of a farm or ornamental horticulture business, a farm manager or herdsman, or a landscape foreman (17 per cent); a career employee with the federal government working in an extension, inspection or experimental position (14 per cent); a high school or college science teacher (13 per cent); or possibly an administrative officer in a private, agribusiness-type operation (11 per cent). It does appear to be relatively certain, however, that the typical alumnus has reached the Professional and Managerial, regular level and that he is involved in an occupation allied, to a considerable extent, to his college education. Both the discussion above and the finding that 26 per cent of the alumni are working in occupations other than those listed in Table 5 indicate that it is unrealistic to attempt to describe the occupation of a typical graduate.

TABLE 5

Distribution of six-hundred and sixty-one Graduates within the Most Frequently Reported Occupational Areas

Occupational Area	Number of Graduates	*Approximate Per Cent of Graduates
Teachers (Primarily teaching science on the secondary school level)	69	
College faculty members	19	
Number of graduates in the teaching profession	88	13
Owner-operators of farms	40	
Farm managers and herdsmen	27	
Owner-operators of ornamental horticulture businesses	34	
Landscape foremen, etc.	14	
Number of graduates in agricultural production	115	17
Number of graduates in sales positions (Primarily in agribusiness)	123	19
Number of graduates in positions with the government (Primarily with the federal government)	95	14
Number of graduates in Administrative and Administrative Control positions (Management positions other than sales management and management in agricultural production)	70	11
Graduates distributed within other occupational areas	170	26
Number =	661	100

*To the nearest whole number.

The above discussion leads logically into a brief analysis of trends. Table 6 below presents a comparison of the distribution of the alumni in 1960[13] and those in the current study of 1964 within the occupational areas described in Table 5. Although positions in sales (19 per cent) and argicultural production (17 per cent) remain the most frequently occupational areas, they have both decreased considerably (an average of 5 per cent) in relation to the others. A growing number of alumni appear to be moving into government employment (+ 4 per cent) and into teaching (+ 5 per cent) with a small increase evident in administrative positions (+ 1 per cent). It appears to be significant that the per cent of alumni in other occupational areas has remained constant (26 per cent). Apparently the alumni, moving out of positions in agricultural production, are finding challenging opportunities in a variety of occupations. The decrease of graduates in sales can probably be explained by some being promoted into management and by others, because of more general acceptance of the College's degree by employers since accreditation by Middle States, finding employment in industry, education, and government, and entering graduate schools. Another important factor is, of course, the addition of Biology and Chemistry as majors in 1957. Teaching, especially science on the secondary school level, will probably continue to increase in attractiveness to the graduates, while continued interest in careers with the federal government will depend to a great extent on the future fiscal policy of the government concerning the budgets of its various agencies. It might also be assumed that as the age of the College, the number of its alumni, and the number of its majors increase the distribution of its graduates among an ever-wider spectrum of occupations will experience a parallel expansion.

TABLE 6

Comparison of the Distribution of the Alumni in 1960 and the Alumni in 1964 within the Most Frequently Reported Occupational Areas

Occupational Areas	*Approximate Per Cent of Graduates 1960 N – 284	**Approximate Per Cent of Graduates 1964 N – 661	Per Cent of Variation from 1960
Agricultural production	23	17	—6
Sales	23	19	—4
Positions with the government (primarily with the federal government)	10	14	+4
Teachers (primarily teaching science on the secondary school level)	8	13	+5
Administrative & administrative control positions	10	11	+1
Others	26	26	0

*Based on the March 1960 - October 1960 study of Alumni[13].
**Based on the data analyzed in the current study.

Before discussing the implications of this study, attention should be focused briefly on the progress of the alumni in graduate work. Table 7 below shows that twenty-seven per cent of the alumni have earned or are working toward graduate degrees. The largest number (12 per cent) are moving toward Masters' degrees, while ten per cent have already earned that second level degree. Three per cent are moving toward Doctors' degrees, while two per cent have already earned that third level degree. Both the increased interest in teaching (+ 5 per cent) among the alumni and the success of the new majors in Biology and Chemistry appear to support the assumption that a growing per cent of the College's graduates will enter graduate schools in the years ahead.

TABLE 7

Progress Toward Graduate Degrees of six-hundred-and-sixty-one Graduates

Extent of Progress Toward Graduate Degree	Number of Graduates	*Approximate Per Cent of Graduates
Working toward Master's Degree	77	12
Earned Master's Degree	68	10
Working toward Doctor's Degree (Ph.D., Ed.D., M.D., V.M.D.)	22	3
Earned Doctor's Degree	10	2
(Ph.D., V.M.D.)	484	73
N =	661	100

*To the nearest whole number.

IMPLICATIONS OF THE STUDY

What are the implications of this study to the undergraduate, the graduate and the administration of the College? First, it seems to indicate to the members of the student body that they should attempt to learn as much as they are able from the broad curriculum of the College, for it is difficult to predict accurately, in the current world atmosphere of dramatic change, what particular occupation they will be engaged in ten or twenty years from now. Secondly, it suggests to the graduates that they should continue their intellectual and professional development, whether it be formally in a university or informally through study and practice at home, as their current occupation may merely be a bridge to another career that may appear, at first glance, to be only remotely allied to their present position. Thirdly, it indicates to the College that its curriculum is an effective one, but that the faculty and the administartion must continue to adjust it to the dynamic society in which it functions. Finally, it gives the College reason for being proud of the impressive accomplishments of its alumni who have not only been pioneers, blazing trails toward more lucrative and stimulating employment for those who follow, but who also, through the factual record of their successful occupational experiences, made the most significant contribution to their Alma Mater's recent accreditation by the Middle States Association.

SELECTED REFERENCES

[1] Edwards, A. *Comparative Occupational Statistics for the United States, 1870-1940.* Washington: Government Printing Office, 1943.

[2] Glick, P., Jr. The Occupational Choices, The Occupational Values, and the Anticipated Occupational Frustration of the Agricultural Majors of Delaware Valley College of Science and Agriculture. Unpublished Doctoral dissertation, Rutgers, The State University, New Brunswick, New Jersey, 1962.

[3] Glick, P., Jr. "Occupational Values and Anticipated Occupational Frustration of Agricultural College Students," *Personnel and Guidance Journal,* XLII (March, 1964), pp. 674-679.

[4] Glick, P., Jr. "Anticipated Occupational Frustration," *The Vocational Guidance Quarterly,* 11, (December, 1963), pp. 91-95.

[5] Glick, P., Jr. and others. "Occupations Engaged in by Graduates of Delaware Valley College of Science and Agriculture," mimeographed report, March, 1963.

[6] Hartson, L. "Vocational Choices: Before and After College," *Occupations,* XVI (November, 1937), pp. 138-142.

[7] Moser, H. P., Dubin, W., and Shelsky, I. M. "A Proposed Modification of the Roe Occupational Classification." *J. Counsel. Psychol.,* III (February, 1956), pp. 27-31.

[8] Roe, A. *The Psychology of Occupations.* New York: John Wiley & Sons, Inc., 1956.

[9] Super, D. E. *The Psychology of Careers.* New York: Harper & Brothers, 1957.

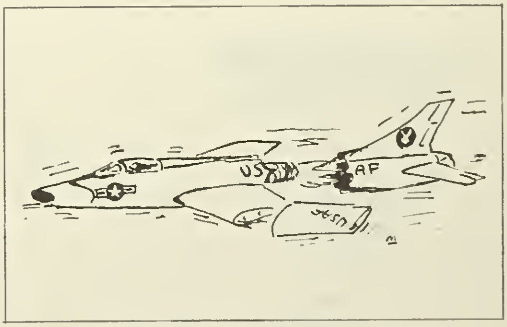
[10] Super, D. E. and Bachrach, P. B. *Scientific Careers and Vocational Development Theory.* New York: Bureau of Publications, Teachers College, Columbia University, 1957.

[11] Super, D. E. and Overstreet, P. B. *The Vocational Maturity of Ninth-Grade Boys.* New York: Bureau of Publications, Teachers College, Columbia University, 1960.

[12] United States Bureau of the Census. *1960 Census of Population, Alphabetical Index of Occupations and Industries (Revised Edition).* Washington, D. C.: Government Printing Office, 1960.

[13] Work J. and Glick, P., Jr. *Results of Delaware Valley College of Science and Agriculture Alumni Questionnaire, March 1960—October 1960,* mimeographed report, January, 1961.

M	O	A	■	E	Y	E	■	W	A	L	E	S
E	G	G	■	S	A	T	■	A	V	E	R	T
G	R	E	A	T	W	H	I	T	E	W	A	Y
■	E	O	C	E	N	E	■	E	R	I	■	■
E	■	F	I	R	■	R	U	R	■	S	P	A
B	Y	R	D	■	F	■	N	■	T	A	R	A
B	E	E	■	P	L	A	T	A	■	N	O	R
■	■	P	S	E	U	D	O	P	O	D	■	O
A	S	T	O	R	■	D	■	E	X	C	O	N
S	T	I	R	■	M	E	N	■	A	L	■	■
S	A	L	I	V	A	R	Y	G	L	A	N	D
A	L	E	■	I	T	■	E	■	I	R	O	N
Y	E	S	■	C	A	■	T	U	S	K	■	A



Wait 'til I get hold of that mechanic!

For everything
pertaining to

**Real Estate
and
Insurance**

see

J. Carroll Molloy

REALTOR

348-3558

Weisbard's Drug Store

**Prescription Drug Store
Since 1874**

Main and State Streets
DOYLESTOWN, PA.

PEARLMAN'S
34 S. MAIN
DOYLESTOWN, PA.

**R.C.A. TV
Records - Record Players
Musical Instruments
and Accessories
Fisher Stereo**

FI 8-2600

34 S. MAIN STREET

W. J. NYCE'S
SHOE STORE

"The Home of Nice Footwear"

LOW DOWN ON
LATEST STYLES

West and State St.

Doylestown, Pa.

Howard's Jewelers

Expert Watch - Clock
Jewelry Repairing

35 E. STATE STREET
DOYLESTOWN, PA.

Phone: 348-4675

DOYLESTOWN
TRUST CO.

115 W. Court Street
Doylestown, Pa.

COMPLETE BANKING SERVICES

Member of F.D.I.C.

Compliments
of

ELY'S CLOTHIERS

Doylestown, Pa.

"OUTFITTERS
FOR
THE
COLLEGE MAN"

Kershner's Pharmacy

Joseph H. Kershner, Ph.G.

DOYLESTOWN, PA.

Phone: 348-4666

OFFSET LETTERPRESS

LAUCHMEN
PRINTING
COMPANY

855-3123 LANSDALE

*"The Best
at
Its Best"*

ED'S
DINER

Franklin and State Streets

DOYLESTOWN, PA.

STUDENT LITERARY CONTEST

Cash awards of $150.00 will be awarded to the student authors who submit the best entries in the following classes:

1) Fiction and Poetry
2) Personal Experiences
3) Scientific and Technical papers

- No specific length will be required for the entries, but the length should be appropriate for the type of article.
- Entries must be submitted no later than February 1, 1965.
- Contest is open to all Delaware Valley College students.
- It is not necessary that entries have been written for this contest, although all entries must be original and have been written by the student who enters them.
- Further information will be supplied at the beginning of the fall semester.

The *Gleaner* is published three times in the school year by the students of the Delaware Valley College of Science and Agriculture. Subscription rate $1.50 per year.